

ELECTRONIC BOOK WITH MULTIPLE PAGE DISPLAYS

BACKGROUND

Presently the concept of an electronic book (such as the 5
omni book concept invented by Alan Kay now of Apple
Computer) connotes a device with a single electronically
addressable display in which pages of text are displayed
sequentially in time as a function of some input. On the other
hand real paper books contain multiple pages which may be 10
accessed by means of a natural haptic input. Such pages
however, once printed, are not changeable.

In this disclosure we describe an electronic book with
multiple electronically addressable displays. Such an elec- 15
tronic book embodies the representation of information on a
multiplicity of physical pages which may be may be elec-
tronically addressed or 'typeset' such that the contents of
said pages may be changed by means of an electronic signal
and which may further be handled, physically moved and
written on. The advantages of the present invention include 20
the ability, from within a single electronic book, to access a
large realm of information, which would normally encom-
pass many volumes of standard paper books while still
maintaining the highly preferred natural haptic and visual
interface of said normal paper books. As such, an electronic 25
book with multiple electronically addressable page displays,
as disclosed herein, constitutes a highly useful means of
information interaction.

SUMMARY OF THE INVENTION

The invention provides for an electronic book with mul-
tiple electronically addressable page displays. In one
embodiment such page displays may be thin, low cost and
formed on paper or paper like substrates. Such substrates
may be real paper, ultra thin glass, plastic, polymer, elas-
tomer or other suitable material which embody some or a
majority of paper like qualities including thinness, structure,
manipulability or other characteristics normally associated
with paper in its role as a haptically and visually interactable
display of information. Said page displays additionally 30
comprise address lines and electronically addressable con-
trast media which may be bistable media such that texts or
images written to said page displays may be maintained
without the application of power. Said page displays may
further comprise page strobe or page address logic for the
purpose of electrically addressing a particular page in said
multiple page display book.

Said book may additionally contain electronic memory,
an internal power source, controls and interfaces, which may
either be wired, wireless or optical, for interfacing to various 35
sources of data or communications. Such an electronic
memory may contain the informational content, both textual
and graphical, comprised in a multiplicity of normal paper
books. A user may then select a book of choice and cause,
by means of a control, the electronically addressable pages 40
of said book to be 'typeset' such that after some time delay
the pages of said electronic book display the desired con-
tents.

The invention provides for means of manufacturing the
pages of said electronic book in a low cost way on a paper 45
or paper like substrate. The invention further provides for
means of binding such pages and addressing such a multiple
page electronic book. Additional features including an inter-
face and the ability to write in a reversible manner and have
such writing recorded are also described. Further features 50
and aspects will become apparent from the following
description and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, features and advantages
of the invention will be apparent from the following more
particular description of preferred embodiments of the
invention, as illustrated in the accompanying drawings in
which like reference characters refer to the same parts
throughout the different views. The drawings are not nec-
essarily to scale, emphasis instead being placed upon illus-
trating the principles of the invention.

FIGS. 1A and 1B are partially perspective and partially
schematic views of an electronic book with multiple elec-
tronically addressable pages.

FIG. 2 is a partially perspective and partially schematic
view of an electronic book with multiple electronically
addressable pages open to a single such page.

FIG. 3 is a schematic view of an electronically address-
able page configured for simplified address line layout and
partial page addressability with column strobe.

FIG. 4 is a schematic view of an electronically address-
able page configured for multilayer address line layout and
full page addressability with column strobe.

FIG. 5A is a schematic view of an electronically address-
able page configured for row addressing with analog
selected column lines and FIG. 5B is a schematic detail of
the analog column select scheme.

FIG. 6A is a schematic view of an electronically address-
able page configured for row addressing with digital
selected column lines and FIG. 6B is a schematic detail of
the digital column select scheme.

FIGS. 7A-7D are schematic details of various electroni-
cally addressable contrast media.

FIGS. 8A-8E are schematic details of various switch and
relay assemblies.

FIGS. 9A-9E are schematic details of various switch
structures.

FIGS. 10A-10D are schematic details of various optically
addressed and optoelectronic switch structures.

FIGS. 11A and 11B are partially perspective and partially
schematic views of a single page of an electronic book and
a means for binding a multiplicity of such pages.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to FIGS. 1A and 1B, a book 10 is composed of
multiple electronically addressable page displays forming a
multiple page display ensemble 20 in which each page of
said ensemble may be individually electronically addressed.
Said book may additionally contain: An internal power
source 40 such as a battery; Electronic display drivers 50 to
write information to said page displays where said drivers
may write information contained in a memory or alterna-
tively may write information obtained via a suitable inter-
face or alternatively may write information from another
source such as an electronic pen or stylus or from another
suitable source. Memory 60 which may be a solid state
memory such as flash memory or bubble memory or may be
another form of memory such an optical disk or magnetic
media or may be any other form of memory. Such memory
may contain information including text and/or graphics.
Such information may be for instance the text and graphics
of a selection of books or journals. Further said memory may
be programmable or reprogrammable. Alternatively said
memory may be permanent. Said memory may also be
removable for the purposes of reprogramming or for other